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PROBLEMS OF ELECTRICAL STUNNING

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INTRODUCTION

Electricity has been used occasionally as a stunning agent for animals for several centuries, but the results obtained seem to have been largely a matter of trial and error, and the effect of the electrical and biological variables was not understood. In comparatively recent times, Hobday, and Hertz, have used electrical anaesthesia for abdominal operations, but the results have not been entirely satisfactory ; nevertheless, the idea is an attractive one, since electrical anaesthesia should be easy to induce and free from toxic after-effects on the liver and heart. At the present time electricity is widely used in bacon factories in this country for stunning pigs prior to slaughter, and in some abattoirs for stunning sheep and calves.

From time to time doubts have been raised as to the efficacy of this method of producing unconsciousness. Electrical accidents have occurred in which human subjects have been paralysed as regards voluntary muscular movement, but remained fully conscious of pain (Hume, 1935) ; this condition is similar to that produced by curare, and hence is described as "electrical curarisation." Such a condition is recognised only by interrogation of the subject after the accident, and hence, if it did occur in animals, it would not be appreciated unless special methods were used to detect it. The "curarised" animal would not be able to cry out, or to run away, and so would *seem* to be unconscious of pain. The purpose of the present investigation, conducted by UFAW, was to find out whether animals were truly unconscious after electrical stunning (electroplexy), and, if so, the optimum conditions for the production of unconsciousness.

EXPERIMENTAL PROCEDURE

The greater part of the work was done on rabbits in the laboratory ; the information acquired by this means was correlated with that derived from observations at seven bacon factories, and checked with subjective human data obtained from patients receiving electro-convulsant therapy, and chemical anaesthetics. Finally, a field experiment was carried out at a bacon factory. In the laboratory work an electrical stimulator was used in which the following characters could be independently controlled : voltage, frequency, square wave pulse width, time of application, site of application, and strength of current. The rabbits varied widely as to bodyweight, breed, age and sex, and the only results given are those which could be repeated.

The behaviour of the animal during and after electroplexy was carefully observed and the return to consciousness studied by means of two tests ; these tests, the electrocorticogram, and the cardiac pain reflex originally suggested by Longley, were used first on animals in the familiar planes of nembutal and pentothal anaesthesia, and when standards had thus been established, they were used to interpret the results obtained after electroplexy.

Electro-corticograms (ECoG) were recorded on two channels of a standard six-channel Mitchell electro-encephalograph machine, and the pulse rate, for the cardiac pain reflex, was recorded by taking an electro-cardiogram on another channel of the machine, simultaneously with the ECoG. The same electrodes were used for recording and stimulating ; they consisted of stainless steel pins driven through the skull, so that their tips were in contact with the cortex. The position of the electrodes was checked *in vivo* by X-ray, and *in vitro* by histological methods ; they were inserted under general anaesthesia, but once in position, caused no apparent discomfort to the animal, which continued to feed and move about normally. The electrodes for electro-cardiogram recordings consisted of hypodermic needles, one inserted in the subcutaneous tissue over the heart and the other in the region of the lumbar muscles. The pain stimulus consisted of a pin-prick.

RESULTS

(*A*) *Effect of Electrical and Biological Variables.*—The behaviour of animals immediately after electroplexy was remarkably consistent, rats, rabbits, pigs, sheep and human beings all showing the same essential features in the fit following effective electrical stimulation. The typical sequence of events was as follows :—

(1) Initial momentary flexion of the hind legs, followed by violent extension ; the forelegs were stiff and extended at this stage and the head was flexed strongly backwards. Respiration was arrested and urination and defaecation commonly occurred . . . 0 to 10 seconds.

(2) Rigidity gradually passed off and weak clonic contractions of all limbs occurred . . . 10 to 30 seconds.

(3) Respiration restarted and the animal became flaccid . . . 30 to 60 seconds.

(4) Muscular tone normal, but the animal lay motionless . . . up to three minutes.

The extensor tonus of the hind limbs of the first stage always occurred when the stimulation was sufficient to cause unconsciousness ; if an inadequate shock was given, one or more of the other stages might be seen but extensor tonus did not occur. A fit starting with extensor tonus and conforming to the general pattern described above was therefore used as a criterion of effective electrical stimulation, and it could conveniently be used for this purpose in practice in factories and abattoirs.

The electrical variables studied were amperage, voltage, frequency, electrical pulse width and time of application, and of these amperage was the most important factor. A threshold value of 25 to 30 mA. was essential to produce unconsciousness in the rabbit, and no alterations in the other factors compensated for insufficient current strength. Frequencies of 50 up to 200 cycles per second were all suitable, and as the mains frequency in this country is 50 cycles per second, and in America 60 cycles per second, no practical difficulties are presented here ; 25 cycles per second did not cause uncon-

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sciousness—the animal twitched synchronously with the pulse—and human experience shows that frequencies of 500 cycles per second or over may cause pain. Provided that the pulse width was at least 2 mS., and the time of application at least two seconds, increases in these factors made little difference to the observed results. It was not possible to compensate for low voltages, and amperages below 30 mA, by increasing the time of application of the current ; this was somewhat surprising in view of the general application of strength-duration curves to physiological tissues, but it seems that the usual relationships only hold good for very much shorter times of application.

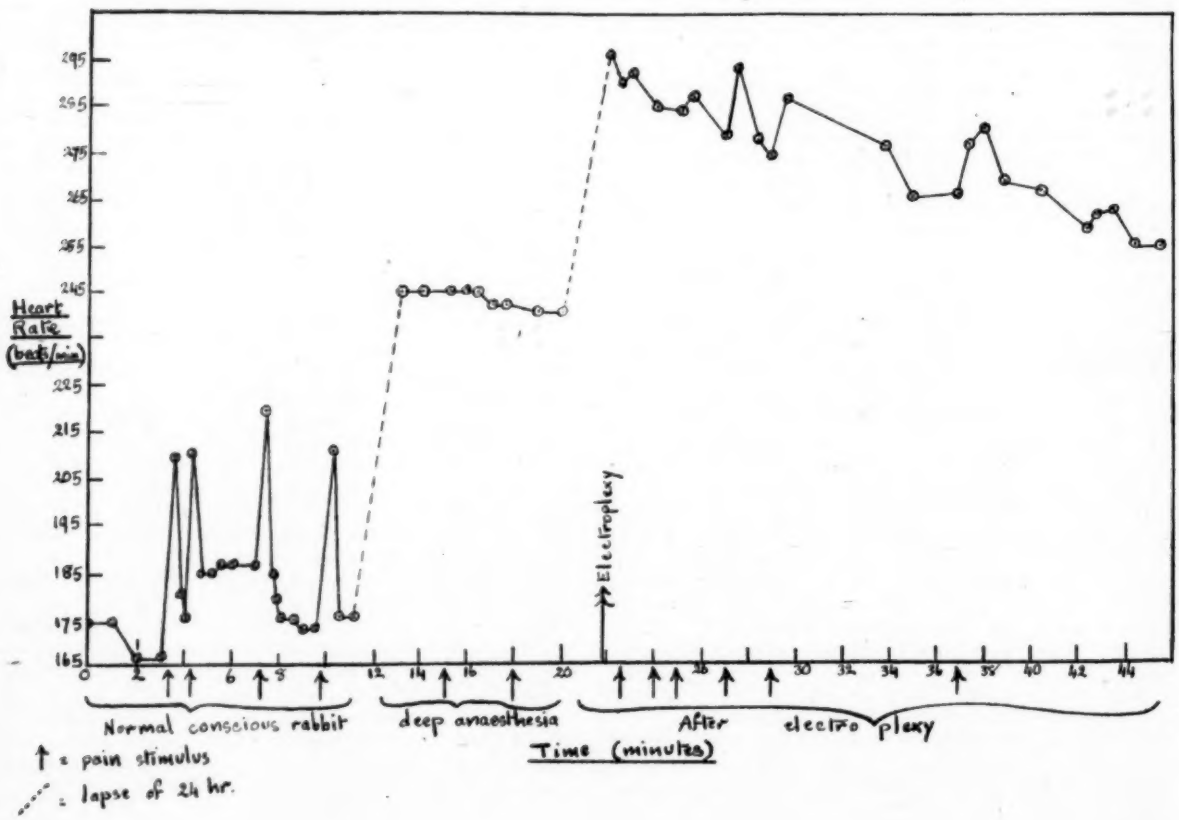
The effect of food and water on the threshold for electrical stimulation has been extensively studied by Davenport and Davenport (1948) and their results indicate that the caloric intake should be restricted and the state of hydration increased, in order to lower the threshold. Animals awaiting stunning should therefore be allowed unlimited water, but no food. The most effective site for stunning was the region of the motor cortex ; dissection showed that the usual position of the tongs in bacon factory practice is such that the current does pass through this part of the brain. There is considerable individual variation in resistance to electroplexy, and it appears to be a hereditary character ; Stone *et al.* (1949) have, by in-breeding, produced strains of mice which require abnormally large currents for stunning, and in the present investigations, rabbits with roan fur were particularly resistant, requiring about 20 per cent. greater current than the average animal, while Dutch rabbits were stunned with an unusually low current. Slaughtermen observe that certain breeds of pig, particularly those with predominantly black skins, are more resistant to the electric goad than others.

(*B*) *Assessment of Consciousness.*—When a pain stimulus was given to a conscious animal, its heart rate increased by 20 to 30 per cent. for a period of about 15 seconds : this cardiac pain reflex always occurred and its magnitude did not vary appreciably with the strength of the stimulus. When the rabbit was deeply anaesthetised the response was abolished, and in states of light anaesthesia it was reduced in size and the return to normal was slower. (Fig. 1.) This reflex could therefore be used as an indication of pain perception, and since it did not depend on voluntary muscle, it would be valid in a curarised animal, when the usual tests were no longer reliable.

The ECoG of a normal conscious rabbit, recorded from the pre-central granular area of the cortex, showed a regular 6 to 8 cycles per second rhythm ; this rhythm has been noted by other workers and described as the α-rhythm of the rabbit. During light anaesthesia this rhythm appeared in intermittent bursts, and when the animal was surgically anaesthetised it disappeared completely, being replaced by a slow 1 to 2 cycles per second rhythm. The ECoG thus

Figure 1

Effect of pain stimulus on heart rate of rabbit under various conditions

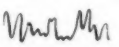
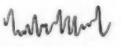
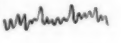


gave further indications as to the state of consciousness of the animal, and, like the cardiac pain reflex, was not affected by paralysis of voluntary muscles.

Immediately after an electroplectic fit the cardiac pain reflex was negative and the ECoG was almost flat, indicating that the cortex was completely inactive ; the paw retraction, corneal and pupillary reflexes were also negative. The first reflex to reappear, about 40 seconds after stimulation, was the pupillary reaction to light ; soon after this the cardiac pain reflex became positive, indicating that the animal was able to perceive pain. At this stage the paw retraction reflex was not present and apparently the rabbit was incapable of any voluntary muscular movement ; in fact, to the casual observer it still appeared to be unconscious. This period of curarisation lasted only about half a minute, but it was extended to about 10 minutes if two electrical stimuli were given in quick succession, instead of the usual single shock. If left to itself, the animal usually made no attempt to rise for 5 to 10 minutes after control of voluntary muscle had been re-established as shown by the paw retraction reflex. (Table I.)

TABLE I

CHANGES IN ACTIVITY OF RABBIT C.N.S. AFTER ELECTROPLEXY, AS SHOWN BY REFLEXES

Time after stimulation (minutes)	Pupil reflex	Cardiac pain reflex		Paw reflex	Voluntary movements	Electrocorticogram
		Per cent. increase with stimulation	Duration of response (seconds)			
Before	Normal	12	7	Normal	Normal	
1	—	—	—	—	—	
1¼	Normal	—	—	—	—	
2	„	—	—	—	—	
5	„	1	70	—	—	
7	„	6	70	—	—	
9	„	5	70	V. slow	—	
17	„	5	70	Slow	—	
25	„	7	30	„	Slight	
120	„	8	12	Normal	Normal	

α-rhythm first reappeared intermittently in the ECoG at the time when the paw retraction reflex became positive ; before this, in the stage of curarisation, spasmodic activity appeared but there was no regular rhythm as in the fully conscious animal. Continuous α-rhythm was usually re-established 5 to 10 minutes after the original stimulation. ECoG recordings were continued for 45 minutes after stimulation, and several very interesting phenomena were seen in the later stages of the recovery period ; these all indicated that, although the animal appeared quite normal at this time, the integration of the cortex with the other parts of the brain was not yet complete. Records almost identical with those shown in petit mal epilepsy in human subjects were seen on several occasions, and there was some evidence of temporary damage to the brain in regions other than those immediately adjacent to the electrodes. Another interesting observation, from the practical point of view, was the appearance of a hypersensitive state of a few minutes' duration, occurring 15 to 20 minutes after electroplexy ; at this time the slightest noise, or movement on the part of the experimenter, caused the animal to make violent escape movements. This state did not always occur, but it would be a very inconvenient sequel to electrical anaesthesia, if this had been used for operative interference.

DISCUSSION

The experiments on the effect of electrical and biological variables revealed two important practical points. Firstly, it is amperage, not voltage, that is the important criterion of the efficiency of electrical stimulation ; in practice, it is usually voltage that is measured and checked, and it is quite possible for this to be normal while the current is too low. The relationship between current and voltage depends on the resistance, and the second important point which emerged from the experiments is the inherent variation of resistance between different animals. It cannot be assumed that the same minimal current will stun every animal of a given bodyweight ; moreover, the resistance will also depend on the state of the skin under the electrodes, and on the pressure which is applied to the tongs by the slaughterman. It is not always easy to maintain constant pressure as a heavy beast falls, and fatigue may also cause the handler to exert less pressure ; the resistance between electrode and skin will increase if the tongs are not pressed well against the animal's head, and thus the current may be too low for efficient stunning.

The study of the effect of electroplexy on consciousness showed, first, that a fit with extensor tonus was an essential reaction to stimulation if unconsciousness was to be achieved. Secondly, the experiments showed that after electroplexy there were three distinct stages of recovery before normal consciousness was restored :—

(1) Complete unconsciousness with no reflexes present.

(2) Consciousness of pain, as shown by a positive cardiac pain reflex, with paralysis of voluntary muscles.

(3) Return of reflexes involving voluntary muscle, but absence of movement unless disturbed forcibly.

Stage 2, which is normally short, is a condition which should be borne in mind in any future work on the development of electrical anaesthesia, and in present-day abattoir, and bacon factory, practice. Factory conditions are such that pigs are normally bled immediately after stunning, while unconscious ; only if some delay occurs is there any real danger of a pig being " stuck " while in the " curarised " condition of stage 2.

The nature of the cerebral activity which is responsible for these various states is not yet fully understood, but the ECoG and other tests have given some useful information. Many theories have been put forward to explain the origin of the regular cortical rhythms seen in man and animals in the conscious state ; the majority of workers consider that these rhythms depend on the integration of thalamic and cortical activity.

The exact path of the cardiac pain reflex is uncertain ; the afferent path is via the lateral spino-thalamic tract to the ventral part of the lateral thalamic nucleus, from which there are numerous radiations to the cortex. The efferent path is from the cortex to the vaso-motor centre in the medulla and thence to the heart through the vagus, but the details of the connection between efferent and afferent sides of the reflex are not known definitely. The pupillary reaction to light does not involve any of the higher parts of the brain ; it merely indicates that the brain is functioning at the level of the Edinger-Westphal nucleus.

Bearing these facts in mind, the following is a possible explanation of the changes seen after electroplexy. The current causes maximal stimulation of all brain cells, and there is a period of exhaustion, corresponding to stage 1, when no response can be elicited. After this the lower parts of the brain recover and the path of the pupillary reaction is functional ; the cortex and the thalamus are still inactive, and there is no response to pain, therefore. Next, the cardiac pain reflex reappears, showing that the thalamus and parts of the cortex have recovered ; integration of these regions, as shown by presence of the α-rhythm, has not yet occurred, and the cortical control of skeletal muscle has not been resumed. This inactivity of the cortex may be due in part to McCulloch's " suppressor strips " ; stimulation of the appropriate cortical strip with strychnine can abolish tendon reflexes for as long as 20 minutes (Jefferson, 1950). Electroencephalograph records of human subjects after electroconvulsant therapy show that there is a period when thalamic activity alone is recorded from the scalp, the normal cortical activity being absent. It seems possible that the hypersensitive stage seen in some animals after electroplexy may be due to a comparable condition, since the cortex normally acts as a restraining influence on the more violent actions of the lower brain. Similarly, the " epileptic " records seen in the recovery stage in animals give evidence of ineffective cortical activity.

Some interesting observations on the effect of electroplexy on healing in rats have recently been made by Holzbauer *et al.* (1952). They found that electric stimulation of the brain caused a marked delay in the healing of wounds by first intention. The mechanism of this effect is not explained, but it is obviously of great importance when electrical anaesthesia is contemplated for surgery.

The experiments described in this paper show that there are many factors which must be considered in any future work on the development of electrical anaesthesia ; some of these are obvious, but the state of " electrical curarisation," the possibility of brain damage and impaired healing power of tissues are vitally important factors which may easily be overlooked.

Summary

A new method of assessing pain perception in animals is described, which is valid in states of " curarisation." The unusual condition of animals after electroplexy is discussed, and the effect of electrical and biological variables on this procedure is summarised.

Acknowledgments.—My thanks are due to Major Hume for drawing my attention to this problem, and to Dr. Derek Richter for his help and encouragement. I should also like to thank the bacon factory managers and veterinary surgeons who have kindly allowed me to make observations on their premises.

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The Council of the British Medical Association proposes to increase the standard annual subscription from 4 gns. to 6 gns.

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Owing to an outbreak of rabies in jackals in the Chipinga district, Southern Rhodesia, the Veterinary Department is considering a drive to eliminate all jackals.—*Daily Telegraph.*

BOVINE TRYPANOSOMIASIS—A METHOD FOR QUICK DIAGNOSIS

BY

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Introduction

Recently, in a Kenya European Settled Area, it became desirable to examine large numbers of cattle for trypanosomiasis. It was also necessary to treat all positive cases found, at the same time disturbing as little as possible the farm routines and milk production. Further, it was politically necessary to provide from indisputable sources figures showing the incidence rate of infection.

The usual technique of "wet smearing" has obvious disadvantages:—

(a) Cattle must be held in crushes for long periods, while individual blood samples are taken and examined.

(b) Where biting fly density is heavy, the actual examination can be a very uncomfortable task for microscopists and their assistants.

(c) Dust and rapid evaporation due to strong sunlight may interfere with accurate diagnosis.

A technique was therefore evolved using the quick staining method as described by Field (1940) for the diagnosis of malaria parasites.

Technique

Herds were brought into crushes and serially numbered with coloured pig marker. Thick blood smears were taken at the same time and the slides correspondingly marked. Herds were then allowed out to graze in the vicinity.

Slides so taken were heat fixed or allowed to dry in the sun for a matter of a few seconds.

Staining was then carried out using a modification of Field's Stain, made up of brilliant cresyl blue and a phosphate buffer.

Slides are dipped into the stain for one second where lysis and staining occur simultaneously. On removal they are rinsed for five seconds by waving gently in a vessel of clean tap water, and are placed in a rack to drain and dry, after which they are ready for microscopic examination.

The whole process from the taking of the blood to the prepared stained slide takes on an average about one to one and a half minutes.

On examination all red blood cells are haemolysed and most of the haemoglobin removed, leaving a field containing only leucocytes and any trypanosomes present.

The technique of staining may therefore be summarised as follows:—

(1) Rapidly dry the smear and lightly fix in a flame.
(2) Dip smear into a jar of stain for one second.
(3) Differentiate in clean tap water for five seconds.
(4) Drain and dry in a slide rack.

Composition of the Stain

The composition of the stain as recommended by Field is as follows: brilliant cresyl blue, 1 gramme; disodium hydrogen phosphate (anhydrous), 1 gramme; sodium dihydrogen phosphate (anhydrous), 1·25 grammes; distilled water, 100 c.c.

The phosphate salts are first dissolved. The solution is approximately isotonic with blood serum and is of *p*H 6·6. The stain is now added, solution being aided by grinding in a mortar. After filtration the stain is ready for use.

Discussion

In an area of mixed *Trypanosome congolense-Trypanosome vivax* infections, this method allows an exact diagnosis of the trypanosomes involved, and thus gives possible indications as to methods of transmission.

On occasions, using this technique, upwards of 350 head have been examined in a day. This has an immense advantage from a disease control point of view, since immediate treatment will prevent further extension. Slides may be examined in the comparative comfort of a tent or hut as near or far from the crush as is convenient.

Farmers much prefer this method of examination to any others employed, since it disturbs cattle least and does not keep them from grazing for long periods, an important consideration if dairy or fat stock are involved.

Acknowledgment.—I am grateful to the Director of Veterinary Services for permission to publish this paper.

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CLEAN MILK PRODUCTION PROGRESS IN WEST WALES

Opening of Carmarthen's New Attested Cattle Mart

Responding to the toast of the guests (proposed by the Mayor) at a dinner held to celebrate the official opening of Carmarthen's new £35,000 attested cattle mart, Mr. Lorimer Hughes, M.R.C.V.S., Superintending Veterinary Officer of the Animal Health Division, said the Ministry had introduced the attested herd scheme in order to encourage farmers to have animals free from tuberculosis. The number of attested herds in the three counties (Carmarthen, Cardigan and Pembroke) was 13,000. It was fitting that Carmarthenshire with the greatest number of cattle in Wales and the greatest number of attested herds in Britain, should form part of the eradication area to be announced.

Wishing the mart every success, Mr. Hughes said it was the most modern of premises.

Mr. Stanley Richards, Chairman of the Carmarthenshire Branch of the National Farmers' Union, who proposed the toast "The Carmarthen Attested Cattle Mart," said that the opening of the new mart would go down in the history of Carmarthen as a climax of the town's appreciation of agriculture. Referring to the decision to eradicate bovine tuberculosis from herds, Mr. Richards said that in 1938 there were 2,700 "clean" herds in the country; in 1940, 16,000, and by 1950 there were 50,000 clean herds. The figures of clean herds in the three counties showed up most of the figures for the rest of the country, but he knew there were difficult areas. In 1950 farmers were set the task of eradicating the disease in their herds by October 1st, 1952. The farmers of Carmarthenshire responded to the appeal and through strenuous efforts, at that date there would be less than 5 per cent. of the herds in the county that would have to receive the compulsory test before the eradication area was declared.

Carmarthenshire had come a long way since 1939 in the production of milk. In that year the county was producing 21,000,000 gallons of milk per year. By 1951 that had been stepped up to nearly 35,000,000. That had been done with a progressively declining labour force which to-day had reached a dangerously low level. If the position were not improved it was bound to have a bad effect on the output of farms in the county. It was deplorable to think that the three counties of Carmarthenshire, Cardiganshire and Pembrokeshire which could show the best figures in clean milk production for the whole country, were included in the area with the lowest number of farms connected up with electricity. The achievement was therefore all the more remarkable.

"Progress is the lifeblood of all industries," said Mr. Clifford Jones, Deputy Mayor of Carmarthen, "and in this the oldest of them all, West Wales has led the way for many years." Mr. Jones said that far-sighted agriculturists in the county had seen many years ago the advantages of clean milk and their efforts and struggles had resulted in the area being designated as one of the "clean" areas in the country.

"Tubercle-free milk has a great future and obviously Carmarthen and district will become the reservoir from which the breeders in other parts of Britain will draw for their stock," he added. "This could only be done through the new mart. So not only West Wales farmers but the town of Carmarthen would contribute to the future health and well-being of the people everywhere."

A NOTE ON THE ISOLATION, FROM SERUM, OF A HEAT-STABLE GROWTH FACTOR FOR THE CONTAGIOUS BOVINE PLEURO-PNEUMONIA ORGANISM

BY

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Early attempts to find a heat-stable substitute for the serum used in Bennett's (1932) medium which would support the growth of the pleuro-pneumonia organism failed completely. Among the substances tried were Fildes's solution, phosphate buffers, peptic and papain digests of serum, dialysates of serum, red cell stromata, yeast, agar and gelatin. Efforts were also made to "adapt" the organism to grow in plain broth by subculturing it in broth containing successively smaller amounts of serum; it was possible to train it to grow in broth containing 0·3 per cent. serum but never in broth completely devoid of serum.

Preliminary experiments showed that the growth factor in serum was heat stable, since autoclaved serum broth supported growth. The results of a typical experiment are shown in Table I. One c.c. volumes of 48-hour growths of four different strains in 10 per cent. serum broth were sown to 9 c.c. volumes of plain broth (PB) and to 9 c.c. volumes of autoclaved serum broth (ASB). Successive 1 c.c. subcultures to the homologous medium (*i.e.*, PB to PB and ASB to ASB) were made every second day. At the same time subcultures were also made to serum broth to check whether, in fact, growth had occurred or not. All growths were confirmed microscopically using stevenel blue (Priestley, 1952). It may be seen that in no case did growth occur beyond the first tube of plain broth which, from the 1 c.c. seed, contained 1 per cent. serum; whereas in the autoclaved serum broth growth continued unabated. Quite apart from the time factor involved (30 days), which would in any case have had the effect of reducing the viability count of the seed, the subculturing in autoclaved serum broth was carried to a point (15 subcultures) well beyond the original end-titres of the seed cultures, the highest dilution of which to show growth was $1:1^{11}$.

Using a similar technique it was shown next that the

Table I

Showing Growth in Autoclaved Serum Broth

Strain	Highest dilution of initial seed to show growth	Medium	Results of culture to serum broth of subculture number									
			1	2	3	4	5	6	7	8	10	15
237 n.v.	$1:10^{11}$	ASB	+	+	+	+	+	+	+	+	.	+
		PB	+	−	−	−	.	.	.	.	.	.
139 n.v.	$1:10^{10}$	ASB	+	+	+	+	+	+	+	+	+	+
		PB	+	−	−	−	.	.	.	.	.	.
327 v.	$1:10^{10}$	ASB	+	+	+	+	+	+	+	+	+	+
		PB	+	−	−	−	.	.	.	.	.	.
1178 v.	$1:10^{9}$	ASB	+	+	+	+	+	+	+	+	+	+
		PB	+	−	−	−	.	.	.	.	.	.

+ = growth ; − = no growth ; . = not tested ;
n.v. = non-virulent ; v. = virulent ;
ASB = autoclaved serum broth ; PB = plain broth.

factor was separable from the heat coaguable proteins of serum; thus, if serum broth is boiled and then filtered the filtrate supports growth. Similarly if serum is diluted in saline, boiled and the coagulum filtered off, the factor is found present in the filtrate; from this filtrate it can be precipitated by saturation with ammonium sulphate and then concentrated by solution in water and subsequently purified by dialysis through cellophane.

The growth factor was finally traced as follows: A volume of serum was mixed with an equal volume of saturated solution of ammonium sulphate; the globulin precipitate was removed by filtration through paper, resuspended in distilled water and purified by dialysis; this was referred to as G. The filtrate was saturated with ammonium sulphate; the albumin precipitate was removed by filtration, dissolved in water and purified by dialysis; this was referred to as A. The filtrate from the albumin precipitate was dialysed and then referred to as F. Portions of A and G were brought to the boil and filtered; the clear filtrates were referred to as AF and GF and the coagula as AC and GC respectively. Portions of these seven fractions were added to Bennett's broth in amounts estimated as roughly equivalent to that amount contained in 10 per cent. serum and, after *p*H adjustment to 7·6 and sterilisation, growth trials were run as before with the results shown in Table II.

TABLE II

SHOWING GROWTH IN BROTH CONTAINING SERUM FRACTIONS

Fraction	Results of culture to serum broth of subculture number											
	1	2	3	4	5	6	7	8	9	10	12	15
A	+	+	+	+	+	+	+	.	+	+	+	+
G	+	+	+	+	+	+	+	+	.	+	+	+
AF	+	+	+	+	+	+	+	+	+	+	+	+
GF	+	+	+	−	−	−	.	.	.	.	.	.
AC	+	+	+	+	−	−	.	.	.	.	.	.
GC	+	+	−	−	−	−	.	.	.	.	.	.
F	+	+	−	−	−	−	.	.	.	.	.	.
PB	+	−	−	−	.	.	.	.	.	.	.	.

A = albumin solution ; G = globulin solution ;
AF = filtrate from boiled albumin solution ;
GF = filtrate from boiled globulin solution ;
AC = coagulum from boiled albumin solution ;
GC = coagulum from boiled globulin solution :
F = filtrate from serum completely saturated with $(NH_4)_2 \cdot SO_4$.

It will be seen that the growth factor was present in the albumin solution (A) and in the filtrate from the coagulated albumin solution (AF). Autoclaved broth containing AF gives a clear medium; growth of the pleuro-pneumonia organism in this medium results in an obvious turbidity similar to that in serum broth.

Growth factors of this nature have been isolated from since the growth factor is not precipitated by half-saturation with ammonium sulphate and since it was not present in the globulin coagulum (GC) or in the filtrate from the coagulated globulin solution (GF), it seems probable that it was brought down in the globulin precipitate purely mechanically.

Growth factors of this nature have been isolated from horse, ox, sheep and goat serum.

DISCUSSION

During the course of this work Smith and Morton (1951) reported the isolation from serum, and other substances, of a factor which supported the growth of "pleuro-pneumonia-like" organisms; unfortunately they did not test its activity for the pleuro-pneumonia organism itself and we have not tested our fraction against "pleuro-pneumonia-like" organisms; it seems reasonably certain, however, that the two factors are the same. Smith and Morton suggested that the factor was ". . . a protein of low molecular weight or some large polypeptide derivative."

Apart from its academic interest the isolation of a heat-stable growth factor has considerable practical application. The medium used here for vaccine production is Bennett's broth containing an added 10 per cent. serum collected under sterile conditions. In other territories a similar medium is used except that the serum is sterilised by filtration. In neither case can the final medium be sterilised by autoclaving and, because of a comparatively high rate of contamination, this is a limiting factor in vaccine production. With the isolation of the heat-stable growth factor it should now be possible to overcome this difficulty.

SUMMARY

The factor in serum necessary for the growth of the contagious bovine pleuro-pneumonia organism has been shown to be heat stable and separable from the coaguable proteins.

Acknowledgments.—We wish to express our thanks to Mr. J. T. R. Evans for his encouragement and to Mr. W. H. Glanville for permission to publish.

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BRITISH ASSOCIATION MEETING

Professor A. V. Hill, F.R.S., President of the British Association for the Advancement of Science, will deliver his inaugural address on "The Ethical Dilemma of Science" at the 114th Annual Meeting of the Association, which is to open in Belfast on September 3rd. A ceremony for the conferment of honorary degrees of the Queen's University will precede the Presidential Address.

The preliminary programme for the meeting contains summary titles of about 60 sessions on separate subjects, and it is expected that some 350 speakers will address the Association's 13 sections during the five-day meeting. Many sections will deal with the science of the region (geology, geography, biology, and folk-lore, as presented by local experts); others will refer to subjects of local interest, such as shipbuilding, food, and fibre; but the main body of the programme will be concerned with subjects of general and topical interest. It is hoped that Dr. D. W. Bronk, President of the American Association for the Advancement of Science and President of the United States National Academy of Science, will be present to deliver the British-American Association exchange lecture.

The Times recalls that on three previous occasions the Association has assembled in Belfast: "this year's meeting comes exactly 100 years after the first in the city and 50 years after the third visit. Altogether the British Association has held eight meetings in Ireland, others having been in Dublin and Cork."

* See Erratum - p. 276.

CLINICAL COMMUNICATION

AN UNUSUAL DIPHTHEROID ISOLATED FROM SHEEP

A PRELIMINARY NOTE

G. B. S. HEATH and ISABEL BATTY
Ravenglass, Cumberland

Abscesses in the region of the head and neck are of common occurrence in sheep, particularly tups. In a series of *post-mortem* examinations, purulent areas frequently have been observed in the thorax, chiefly in pleural adhesions; these were believed to be cases of actinobacillosis, and *A. lignièresi* was, in fact, isolated from one affected tup. The following cases occurred in a flock of Swaledale sheep which was self contained apart from the yearly introduction of rams purchased in Yorkshire. The farm was situated in Eskdale, South-West Cumberland, and the flock mixed freely with sheep from several neighbouring farms when out on the fell. The bacteriological findings indicate that a diphtheroid, of an unusual type, may be implicated in the formation of these facial and cervical abscesses.

Case 1. On 28.9.50, a swab of pus taken from a cervical abscess of a five-year-old tup yielded a mixed culture of *C. pyogenes* and another diphtheroid which was at first believed to be *C. ovis* (*pseudotuberculosis*). Six days later, pus from this abscess had become evil smelling and greasy, and gave a pure culture of the unknown *Corynebacterium*. On 16.10.50 (24 days after taking the first pus sample), the abscesses had almost disappeared, leaving raised scabs in the wool; *C. pyogenes* was the only diphtheroid present in the lesions.

Case 2. A shearling tup which had been ill for several months was first seen on 25.10.50. A hairless area around the eyes, with partial closure of the lids due to oedema, was said to be due to the tup having fallen from a wall some time previously. Copious purulent ocular discharge was present and the tup was killed. At *post-mortem* examination, the most notable lesions were: clear straw-coloured ascites, and small deposits of gelatinous fat alongside the thoracic trachea; the heart was tremendously dilated and the carcase looked anaemic (this was possibly associated with a moderately heavy infestation of *Ostertagia circumcincta* and *Trichostrongylus vitrinus* which was present despite recent anthelmintic treatment); submaxillary and retropharyngeal lymph glands were macroscopically normal but both prescapulars were very hard and the right one was enlarged. A *Corynebacterium* similar to that obtained from Case 1 was isolated from the enlarged prescapular lymph gland.

Case 3. A tup aged four years. First seen on 4.6.51, when multiple abscesses containing viscid green pus were present around the head and neck and over the prescapular lymph glands. Culture of the pus yielded a *Corynebacterium* similar to that isolated from Cases 1 and 2.

Bacteriology.—The organism to which reference is made above is a slightly pleomorphic Gram-positive rod with rounded ends and a slight tendency to exhibit barred staining. Colonies on nutrient agar were small, creamy yellow, and discrete. On blood agar, pin-point colonies appeared in 24 hours and these increased in size until, in five days, they were upwards of 2 mm. in diameter; no haemolysis was observed. On Loeffler's serum, a raised yellow growth caused no liquefaction in four weeks. Discrete colonies in gelatin stab produced no liquefaction at 37° C. or at room temperature; the organism behaved similarly on gelatin slopes. It produced no change in litmus milk, and did not utilise urea. This description corresponds almost exactly with that given by Morse (1949) for *C. ovis*, and because of this similarity and the fact that the organism has not, so far as we know, previously been recovered from British sheep, cultures were referred to Dr. R. Lovell and to Mr. J. R. Hudson. Dr. Lovell concluded that, since this *Corynebacterium* is not pathogenic to guinea-pigs, does not attack urea, and probably contains metachromatic granules, it is not *C. ovis*. Moreover, he was unable to identify the organism with any known species. Mr. Hudson said that, although it was not now virulent for sheep, the organism appeared to be similar in many respects to the "Priezs-Nocard bacillus" frequently encountered in East Africa in cases of lymphadenitis in sheep and ulcerative cellulitis in horses.

It appears, therefore, that the organisms causing these latter conditions in different countries may not always be the same, but might be closely allied members of a group, and the question whether they should be regarded as different varieties of the same species, *viz.*, *C. ovis*, or as a different species, must be left until a large number of strains from various sources have been compared.

Discussion

It is felt that these cases are worthy of record because it appears that similar *Corynebacteria* have rarely, if ever, been reported in British sheep and because of the similarity of the lesions to those regarded as typical of caseous lymphadenitis.

It should be noted, however, that, in one of these cases, *C. pyogenes* was also found, and that it is not uncommon to isolate *A. lignièresi* from somewhat similar lesions. It is therefore not certain that the *Corynebacterium* referred to above plays a major pathogenic rôle, although it appears to do so.

It is hoped that this note may stimulate other workers to investigate more closely the bacteriology of cervical abscesses and, in this connection, it is worthy of note that the *Corynebacteria* referred to above tend to be overgrown by concomitant flora.

Acknowledgments.—Thanks are due to Dr. R. Lovell and to Mr. J. R. Hudson for their kindness in examining this organism.

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INTERNATIONAL ANIMAL HUSBANDRY CONGRESS

The Sixth International Congress of Animal Husbandry is to take place in Copenhagen on July 9th to 14th of this year. The last Congress was held in Paris in 1949 when representatives of 24 countries attended.

In Copenhagen, preparations for the Congress are well under way with the European Association for Animal Production, the Danish Ministry of Agriculture and other Danish farming organisations co-operating to cover all the detailed arrangements necessary for a Congress of this kind.

The five-day programme brings under review much of the modern theory and practice of animal husbandry. Papers read will include aspects such as pure-line breeding, physiology, fertility, and nutrition. The Congress is regarded as a clearing house for new ideas on the subject.

Immediately following the Congress seven separate excursions to various parts of Denmark are planned and members will be taken to places of agricultural interest—shows, research stations and typical livestock farms.

Information regarding this Congress and the excursions run in conjunction with it can be obtained from the Secretariat, Danish Ministry of Agriculture, Copenhagen, and it is pointed out that attendance applications should be sent before May 15th.

* * * * *

Weekly Wisdom

The world is very much like a looking glass and everyone gets the reflection of his own face.—Thackeray.

ABSTRACTS

Diagnosis and Treatment of Bovine Pyelonephritis*

Bovine pyelonephritis, a condition usually diagnosed in the dairy cow, is responsible for appreciable loss in this country, and in view of its infectious nature deserves more accurate study and treatment. The causal organism is *Corynebacterium renale*, though other organisms, usually streptococci, are associated in its exudates. Clinical symptoms of painful, frequent micturition of a bloody, foetid, pus- and mucus-filled urine, with a history of physical wasting and decreasing milk yield, should be taken into account, since the organism may be recovered from the urinary tract of apparently healthy cows.

Disagreement as to pathogenesis of the disease still exists, one school favouring a theory of haematogenous dissemination, while most American workers consider the condition to be ascending in character. Clinical signs certainly occur quite frequently after dystokia, the retention of foetal membranes and infections of the genito-urinary tract and of mammary tissue.

The writers, observing that *C. renale* prefers an alkaline medium for growth and produces an extremely alkaline urine, recommend that the urine be acidified by the administration of 4 oz. daily of sodium acid phosphate ($NaH_2PO_4 \cdot H_2O$), given in drench or capsule for four consecutive days as an adjuvant to therapy by procaine penicillin G at the rate of 2 mega units repeated in 48 hours. No accurate data are provided, but it is stated that seven cases so treated had not relapsed in one year, and four in six months, though one cow did not respond to treatment.

J. P.

* **The Successful Diagnosis and Treatment of Bovine Pyelonephritis.** Thompson, P. H. (1951.) *J. Amer. vet. med. Ass.* **119.** 295-296.

* * * * *

Sheep Pneumonias: Lung Tissue Experiments*

The article describes the lesions produced upon the chorioallantoic membrane of the developing chick embryo by a non-bacterial transmissible agent isolated from the pneumonic lungs of a Suffolk lamb. Infected lung tissue, ground in a mortar with nutrient broth, and subsequently treated with penicillin and streptomycin in the first two passages, was the inoculum, used in 0·2 ml. amounts and injected into the embryo using Burnets' technique. Nineteen passages were effected in this way, producing pneumonia in the embryonic lung with constant and characteristic "pock" lesions on the chorioallantoic membrane which histologically also showed epithelial pearl formation, necrosis and hyalinisation.

The agent isolated suggested a pneumotropic virus. The article includes a brief review of the literature relating to sheep pneumonias of unknown or of suspected virus aetiology.

J. Mack.

* **A Study of the Pathology of the Chick Embryo infected with a Transmissible Agent Isolated from Sheep Lungs.** Raminez, A. M., Gray, M. L., & Thorp, F. (1951.) *Amer. J. vet. Res.* **12.** 201.

* * * * *

Diet and Resistance to Experimental Tuberculosis in Mice*

The authors set out to obtain definite evidence to prove what has long been loosely accepted, namely, that nutrition exerts an important influence on resistance or susceptibility to tuberculosis. One of the difficulties encountered to date in any work undertaken in this connection has been that of isolating the various factors which play a part: housing, ventilation, physical and mental strain, age, sex, heredity, etc.

The mice employed were Albinos of the W-Swiss strain. These were housed in rooms in which the temperature was controlled between 70° and 80° F. and two diets were selected for comparison. Diet 1 was in the form of a stock cube and diet 2 was the slightly modified diet B of Sherman. Whilst the composition of these diets is given in full, the significant chemical differences were as under:—

	Diet 1	*Diet 2*
Calcium	1·28 per cent.	0·35 per cent.
Protein	19·20 per cent.	14·70 per cent.
Fibre	4·80 per cent.	1·30 per cent.
Fat	4·90 per cent.	9·50 per cent.
Ash	6·00 per cent.	2·90 per cent.
Ca/P ratio	1·3:1	0·69:1

The human strain of *M. tuberculosis* was used for the experiment. This was grown on Lowenstein-Jensen slopes. A suspension was made of the surface growth and inoculated intravenously into the tail vein. Any mice which died within 24 hours or did not receive the full dose, were discarded. In the preliminary experiment the inoculum comprised 0·75 mg. of the moist culture in 0·1 ml. of the sterile water. Six male mice were employed on each of the two diets. The experiment ended in 21 days at which time there were only four survivors on diet 1. The lungs of the mice which had been on diet 2 were more voluminous and had more lesions of tuberculosis. The results of this pilot test justified further enquiry and subsequent experiments were planned based on the following criteria: (a) the number of survivors; (b) the survival time; (c) the extent and severity of the lung lesions in animals that survived the experiment.

Two larger experiments, therefore, were carried out, the details of which are given. Pairs of mice, one from each group, were killed at definite intervals and the lesions compared. The first tubercles were observable by the naked eye in the lungs of mice on diet 2 at the 14th day.

It is noteworthy that whilst both diets appear to be sufficient to provide for growth and reproduction, the higher degree of resistance was produced in those mice receiving diet 1. This diet, although accepted as a standard for comparison with other diets, nevertheless does not ensure development of maximum resistance to experimental tuberculosis.

N. S. B.

* **Diet and Resistance to Experimental Tuberculosis in Mice.** Sennupter, S. R., & Howie, J. W. (1949.) *Brit. J. Nutrit.* **2.** 313.

COUNCIL FOR THE PROMOTION OF FIELD STUDIES

Following a series of articles on the field study and research centres maintained by the Council for the Promotion of Field Studies, an article commending the Council's work and inviting support for it was published in *Nature* of June 30th, 1951. It is now announced that Imperial Chemical Industries, Ltd., has decided to enter into a deed of covenant in favour of the Council, for £750 per annum, for the seven years 1952-58. The annual Treasury maintenance grant which the Council receives through the Ministry of Education has recently been much reduced, and it is hoped that the present donation from Imperial Chemical Industries, Ltd., may set an example which other industrial bodies will wish to follow. The Council is also endeavouring to build up a bursary fund to assist deserving students who would otherwise be unable to work at the field centres. "Unfortunately" (adds *Nature*) "these are now very numerous owing to a widespread curtailment of grants for field work by local education authorities."

MEMOIR

LIEUT.-COLONEL PERCY JAMES SIMPSON, D.S.O., T.D., J.P., F.R.C.V.S.

Past-President, R.C.V.S. and B.V.A.

The death of Colonel Percy Simpson, of Maidenhead, reported with profound regret elsewhere in this issue, will evoke the widespread sorrow which accompanies the loss of one whose activities were widespread, always worth while, and, as in the outstanding instance of his work for the Victoria Veterinary Benevolent Fund, often inspired by a sympathetic awareness of human need. An admirable all-round practitioner in an old-established family concern, Colonel Simpson found wider scope for his very considerable business and administrative talents in such varied fields as local authority affairs — he was a County Councillor and Magistrate for Berkshire—the Council of the Governing Body of the profession, of which he was elected President 1937-38, and the Council of the (then) N.V.M.A., which Association honoured him with a three-year term in the Presidential Chair (1931-33).

Percy James Simpson was born at a house in Maidenhead High Street in 1878, the son of the late J. F. Simpson, Esq., J.P., F.R.C.V.S., who for many years carried on an extensive practice in the town and district, and a nephew of the late Sir Henry L. Simpson, F.R.C.V.S. Receiving his early education at Maidenhead College and at Reading School, he entered the Royal Veterinary College, Camden Town, gaining his diploma in 1899 after an academic career of great credit, which included second-class honours in the final year. In those early days he revealed the attributes of ardour for the practical work of his naturally chosen profession, an infectious cheeriness, which also remained with him throughout his life, shrewdness, common sense and kindliness. He was, too, a man of commanding presence.

Percy Simpson stayed with his father in practice at Maidenhead until the outbreak of World War I, when, having been a keen yeoman since 1899, when he first joined the Berkshire Yeomanry as Veterinary Lieutenant, he joined his regiment and was soon sent overseas. He served both in Egypt and Palestine for some four years, being promoted to the rank of Major when he was appointed to the command of the 21st Veterinary Hospital at Belbeis. Some two years later came his appointment as A.D.V.S., of the 21st Corps with the rank of Lieut.-Colonel, and in due course he gained that much coveted distinction, the D.S.O. In 1917 Colonel Simpson was mentioned in despatches and received the T.D. On returning home in 1918, he commanded the Wessex Veterinary Hospital at Romsey, it being from there that he returned to civil life. At the end of his period of war service he joined the local British Legion branch, serving as President for a number of years.

At this point reference should be made to Mrs. Simpson, who maintained a keen interest in the women's section of the Legion. She was Miss Mabel Budgen, and it is interesting to recall that the respective families of both Mrs. Simpson —to whom our deepest sympathies are extended at this time—and Percy Simpson lived in the High Street, Maidenhead; they knew each other at the kindergarten over 70 years ago, the fathers of both becoming Mayors of the borough. At a luncheon held to mark the celebration of their golden wedding, on January 8th, 1951, four of the five bridesmaids who attended at the wedding at St. Luke's Church, Maidenhead, were amongst the company of 46, who included, amongst many friends in the profession, Professor J. B. Buxton, Professor Geo. H. Wooldridge and Mr. H. Bell, together with the Mayor and Mayoress and Deputy Mayor of Maidenhead.

Colonel Simpson's devotion to the corporate activities of the profession was made manifest in loyal service the worth of which his colleagues readily recognised. His period of service as a member of the Council of the Royal College, culminating in the Presidency, included many years as Hon. Treasurer, while his route to the highest honour within the disposition of the N.V.M.A. lay through long and devoted effort on behalf of two of its principal Divisions, the Royal Counties V.M.A. and the Central Veterinary Society, both of which acknowledged their indebtedness by electing him President. It was the former Society, however, the fortunes of which were his paramount concern, for having joined its ranks in 1899, he officiated as its Hon. Secretary for over 20 years. His many other labours on behalf of the profession included membership of the Court of Governors, Executive Council and Finance Committee of the Royal Veterinary College and membership of the Chancellor Committee on Veterinary Practice by Unregistered Persons, while he acted as Secretary to the delegates attending the International Veterinary Congress held in New York in 1934. His appointment as a Steward of the Greyhound Racing Club ensured the profession impressive representation in a field of rapidly increasing importance.

The family tradition of public service was loyally and efficiently sustained by Colonel Simpson, who served on the Council of the Borough of Maidenhead and on the Berkshire County Council. Appointed as County Magistrate in 1925, he was for a period of 11 years Chairman of the County Justices Bench. He was a Director of several local companies. More closely related to his professional experi-

ence were his activities as Local Veterinary Inspector for the Ministry of Agriculture and his extensive work in tuberculin testing for the Ministry of Health, while he had acted as Referee at the Dublin Horse Show and Examiner to the Royal Sanitary Institute.

Colonel Simpson devoted almost a lifetime of interest and ardent support to the Victoria Veterinary Benevolent Fund, succeeding to the Presidency after many years' strenuous effort in the arduous post of Hon. Secretary. In this connection we cannot do better than to quote the tribute to his work paid in these columns in 1931: "No single man has done so much for this deserving cause as has our newly elected President. His many personal visits to deserving cases, the long discussions at Red Lion Square as to how best the strained resources of the Fund could be distributed, have taken much of his valuable time. Everyone is well aware of his prowess as an amateur actor. This pastime is one of his chief relaxations, but even this has not prevented him from turning it to good account for the profession which he loves so well. Many times he and his willing and talented colleagues of the Maidenhead Amateur Dramatic Society have organised performances in London and elsewhere for the Fund, which have been instrumental in bringing to its coffers no less a sum than £230. In this connection it would be ungallant and unfair if one failed to make mention of Mrs. Simpson, whose heart, like that of her husband, is with the profession. Not one of these performances has been organised in which Mrs. Simpson has not taken a very active part in its production, and one is lost in admiration when one thinks of the many weary hours spent at all hours of the night in order to ensure that only the very best possible result would accrue."

Both were united in bringing to fruition a conception voiced by Colonel Simpson at the annual meeting of the Guild in 1931—the formation of a Ladies' Guild for the sole purpose of raising money for the V.V.B.F. The late Dr. Fred Bullock, at that time the Hon. Secretary of the "Victoria," endorsed the idea with enthusiasm and with the ladies themselves rallying nobly to the cause, there was born the Guild, which held its first meeting in 1932 under the most fitting Presidency of Mrs. Simpson. The moving story of the extent to which this auxiliary organisation has assisted the V.V.B.F. to promote the happiness and well-being of countless beneficiaries in sore financial straits was told in our issue of February 23rd, in editorial support of a "coming of age" appeal.

We cannot conclude without extending deep sympathy, also, to Colonel and Mrs. Simpson's only son, Mr. John Ferguson Simpson, a Fellow of the Royal College of Surgeons, practising as an ear, nose and throat specialist in Harley Street.

BLACK MAGIC WINS AGAIN

For the second successive year there was an increased entry at the annual in-hand show of the Hackney Horse Society held on Derby racecourse on Wednesday of last week. The great feature of the show was the contest for the supreme championship, which was won for the third time by Sir Nigel C. Colman's 13-year-old stallion, Black Magic of Nork, son of another great stallion, Nork Spotlight, out of Silhouette of Nork, and bred by the exhibitor. Black Magic was victorious in 1949 and 1950.

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UNIVERSITY OF LONDON B.Sc. (VETERINARY SCIENCE) EXAMINATION

The following, all internal students of the Royal Veterinary College, have passed the above examination (March, 1952): Ahmad, Alauddin; Cripps, Jack Harry Harrison; Jenner, Francis Harold, and Peacock, Ralph.

QUESTIONS AND ANSWERS

The submission of questions for inclusion in this column will be welcomed; they can relate to any aspect of veterinary work, but must be of a general nature—questions cannot be considered in which information is sought regarding diagnosis or treatment of specific cases, nor for which solely a private reply is desired. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Herd Infection with *Vibro foetus*

Q. 411.—*What is the treatment for* Vibrio foetus *infection in a herd? Is streptomycin of some use? If so, by what route and at what dosage? The disease is self limiting; does that mean that cows are not carriers after they finally conceive? Is there any treatment for the infected bull?*

A.—In the present state of our knowledge regarding vibriosis or vibrionic abortion these questions cannot be answered with certainty, for although the disease in cattle was reported as long ago as 1913 by M'Fadyean and Stockman, very few further papers appeared until 1948. This delay in further research may be due to the detection of the *Brucella abortus* organism by Bang in 1897. It was, moreover, necessary to clarify the diagnosis and clinical picture of brucellosis, and more recently of trichomoniasis, before symptoms of vibrionic abortion readily could be distinguished.

All that can be attempted at present is to evaluate the scanty literature that is available. In this respect it is important to note that before any treatment or control can be adopted the method of transmission of the disease must be understood. It is only recently, however, that the infection has been considered essentially venereal. Herrick (1949) isolated the organisms from preputial irrigations of a bull before semen collections. Sjollema, Stengenga and Terpstra (1949) and Stengenga and Terpstra (1950) considered coitus the method of transmission, and isolated the organism from the semen. Evidence is mounting in support of this contention, and it is on the assumption of the correctness of these latest opinions that the methods of control which are outlined below have been based. Once vibrionic abortion has been positively diagnosed in a herd, the suspected and infected cattle may be treated in one of two ways.

(*a*) All breeding is suspended for three months, when these cattle may be returned to the infected bull. During this three-month period the animals are thought to develop an active immunity (at present of unknown duration) and improved conception rates have been reported (Sjollema *et al.*, 1949). Two criticisms, however, may be raised against this if the bull is indeed a carrier as at present seems possible (Sjollema *et al.*, 1949). Firstly, the disease may be perpetuated in a sub-clinical form, and as indicated by Smith, Little and Taylor (1920), a drop in the level of the herd immunity may then result in a recrudescence of the disease. Secondly, it would appear that the bovine has considerable natural resistance to the organisms (see artificial infection experiments reviewed by Webster & Thorp, 1950) so that some animals in the suspected group may not in fact have become infected. These animals would still be susceptible though placed in the infected group, and at the end of the three-month period or after calving might become infected. Clean animals and virgin heifers should be served by a clean bull. The writer, however, would consider that whenever possible artificial insemination with semen from a clean bull would be preferable to the continued use of the infected bull on *any* of the animals. The possibility of cows acting as carriers has not at present been determined; the majority, however, would appear to recover spontaneously following sexual rest.

(*b*) Infected animals are treated specifically with antibiotics and no prolonged sexual rest is required. Chambers (1948), Roberts, Gilman and Larsen (1950), and Webster and Thorp (1950) have shown both penicillin and streptomycin to be effective *in vitro* against *Vibrio foetus*. Treatment has been recommended along two lines, either the parenteral injection of the antibiotics or, more frequently, infusing them directly into the uterus. Following treatment, artificial insemination is advisable.

Haubrich (1950) recommends the intra-uterine instillation of 1 gramme of streptomycin in saline or water oil emulsion.

Easterbrooks and Plastridge (1950) and Plastridge, Williams, Chernack and Easterbrooks (1951) recommend the intra-uterine injection of 1 gramme of streptomycin in 15 ml. sterile water or commercial water oil emulsion.

The results of these treatments although not conclusive appear to be encouraging.

At present there are no records of treatment in the bull ; the difficulty of diagnosis and the uncertainty of transmission complicate this type of research and make conclusive results difficult to obtain, while uncontrolled field observations are difficult to evaluate.

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Boils on Udders and Teats of Milking Herd

Q. 412.—*A Guernsey herd has for some time been affected by boils occurring on the udders and teats of the milking cows only. In spite of a tightening-up of milking hygiene, and a course of staph. toxoid (which reduced the incidence) the condition persists with a high incidence of teat obstructions which are, presumably, associated with the infection. Suggestions for dealing with the condition would be welcomed.*

A.—Persistent abscess formation on the skin of the teats and udder is not uncommon. Occasionally it may arise as a secondary bacterial infection of a primary cow pox infection. The question implies that the staphylococcus toxoid was used in the belief that the causal organisms were staphylococci. If, on the other hand, no systematic bacterial examinations of each cow's milk secretions have been undertaken, milk samples and swabs from the skin lesions should be examined bacteriologically as a first step.

Skin lesions of this type may often be caused by the same organisms as those responsible for actual mastitis. If the organisms isolated from the lesions are the same as those isolated from the milk samples, there should be a concerted attempt to clear up the infections in the interior of the udder by some form of intramammary therapy. This should include all the cows in the herd. It should be coupled with regular twice-daily treatments of the superficial skin lesions with penicillin ointment (100,000 units per gramme) or some of the newer antibiotic ointments, if these can be obtained, such as aureomycin. Alternatively, treatment with a quaternary ammonium compound such as Cetrimide might be useful. However, it is not advisable to use a product of this nature for longer than a week, as its prolonged use has been followed by an increase in the number of teat lesions.

If the herd is a hand-milked herd, vigorous disinfection of the hands should be instituted, including the application of some of the above treatments to the skin of the milkers' hands.

. . . . .

Prevention or Reduction of Oestrum in Working Bitch

Q. 413.—*A client owning a working bitch wishes to prevent oestrum and yet to retain the bitch's utility and keenness for work. Can this be achieved by ovaro-hysterectomy without the bitch becoming lazy or fat? Alternatively, would the exhibition of luteinising hormone in pro-oestrum be successful in markedly reducing the duration of oestrum?*

The bitch is a three-year-old pure bred Collie and has had one litter.

A.—Ovaro-hysterectomy is frequently followed by the bitch becoming fat and somewhat indolent, and while this is not invariable, he would be a bold person who would assert that a working bitch's utility would not be impaired, although many people maintain that working bitches on a reasonable diet do not become fat or indolent following spaying.

The exhibition of luteinising hormone has the effect of terminating oestrum when nearly mature graafian follicles are present in the ovary, but whether the same effect would be achieved by the use of this agent early in pro-oestrum before mature follicles are present the respondent would not care to state categorically. If the wish of the owner is merely to avoid repeated pregnancies in this bitch, ligation of the Fallopian tubes would seem to be the best solution. Oestrum occurs normally and the bitch need not be segregated as service will not result in pregnancy, although some temporary loss of working ability may occur, together with distraction of any males working with her. The use of hormones to cut out or reduce the period of oestrum may well result in some future abnormality of the oestral cycle with adverse effects on general health and in the respondent's view is best avoided if at all possible.

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Correspondence

"*Interdigital Cysts*"

Sir,—I feel the reply to Q.410 on the above subject (*The Veterinary Record*, March 1st, 1952) can only have left the questioner in a state of confusion, and at the risk of being " shot at " also, I would like to comment on the reply.

Your correspondent would seem to be seeking a common cause for all interdigital swellings. I would suggest that there are two separate clinical conditions, the aetiology of one of which is known while that of the other is a matter of theory.

The first condition is one in which the swelling is usually purulent and contains a foreign body of some sort—stones, grass seeds, etc. This condition is well known to any country practitioner and is obviously an abscess of traumatic origin.

The second condition is a painful swelling, the pain being proportional to the size, which, when opened, is found to contain a clear sterile fluid.

In my experience this type of condition is always associated with a hypertrophy of the sebaceous glands which are to be found around the apex of the central pad. (The sebaceous hypertrophy of the

human nose, vulgarly known as a "grog-blossom," is an analogous condition.) I would like to advance the theory that these enlarged and engorged glands cause pressure upon, and occlusion of, the orifices of the adjacent sweat glands, thus resulting in a true retention cyst.

Chemical analysis of the fluid, together with detailed histological examination of affected feet, should prove or disprove the *possibility* of this theory.

The treatment is relatively simple if rather tedious, and consists of a careful curettage of all possible sebaceous glands, concluding with a through and through gauze drain. If carried out thoroughly I believe this treatment will result in a permanent cure in the majority of cases.

Preventive measures which may be of value in susceptible (mainly hairy-footed) breeds consist of careful foot hygiene, *e.g.*, clipping of hair and frequent washing in warm water to prevent the mechanical blocking of sebaceous ducts with dirt, thus allowing a free secretion of sebaceous material. In other cases manual expression of the sebaceous glands may produce useful results.—Yours faithfully, N. ROBERT TURNBULL, 65, Worting Road, Basingstoke. *March 28th*, 1952.

NOTES AND NEWS

Diary of Events

May 7th.—Royal (Dick) School of Veterinary Studies: College Ball

May 8th.—Annual General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, N.W.1, 6 p.m.

May 14th.—Meeting of the Editorial Executive, B.V.A., 2.30 p.m.

May 14th.—Annual General Meeting of the Herts and Beds Division, B.V.A., and the President's Luncheon, at Luton (The George Hotel), 1 p.m

May 14th.—Spring Meeting of the Eastern Counties Division, B.V.A., at Colchester (Red Lion Hotel), 11 a.m.

May 15th.—Meeting of the South Eastern Division, B.V.A., at Maidstone (Royal Star Hotel), 6 p.m.

May 17th.—Annual General Meeting of the Society of Women Veterinary Surgeons, at the Zoological Gardens, Regent's Park, London, N.W.1, 2 p.m.

June 4th.—109th Annual General Meeting of the Royal College of Veterinary Surgeons, at 10, Red Lion Square, London, W.C.1, 12 noon.

June 4th.—Annual General Meeting of the Victoria Veterinary Benevolent Fund, at 10, Red Lion Square, London, W.C.1,—immediately following the above.

June 4th to 6th.—Meetings of Committees and Council, R.C.V.S., at 10, Red Lion Square, London, W.C.1.

June 12th.—Annual Meeting of the R.A.V.C. Golfing Society, at the North Hants G.C., Fleet.

Sept. 8th—13th.—Seventieth Annual General Meeting and Congress of the British Veterinary Association, at Harrogate.

R.C.V.S. EXAMINATIONS

May 7th.—R.C.V.S. Animal Management Examination. Tour commences at Edinburgh.

May 8th.—Entries for D.V.S.M. Examination due.

May 12th.—R.C.V.S. Pharmacology, etc. Examination (Revised Syllabus): Written Examination.

June 5th/6th.—D.V.S.M. Written Examinations at Edinburgh.

June 26th/27th.—R.C.V.S. Membership Written Examinations.

PERSONAL

Births.—CARR.—On April 10th, 1952, at Hope-in-the-Valley, Lewes, to Iris, wife of R. J. Carr, M.R.C.V.S., a daughter—a sister for Angela and Ian.

TUTTON.—On April 24th, 1952, to Patricia (*née* Oddie), wife of E. A. Tutton, B.V.SC., M.R.C.V.S., Brackley, Northants, a son—Andrew Grafton.

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Marriages.—BRIGGS—CAWTHORN.—On April 12th, 1952, at St. Mary's Church, Masham, Yorks, Clive Arthur Edwin Briggs, PH.D., M.R.C.V.S., to Mary Cawthorn, B.SC.

ROBERTS—CRADDUCK.—On April 5th, 1952, at St. Bridget's Church, West Kirby, Cheshire, Henry Gerald Roberts, M.R.C.V.S., of Wrexham, to Dorothy Gladys Cradduck, of West Kirby, Cheshire.

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R.C.V.S. OBITUARY

BOWHAY, Alfred B., O.B.E., Major R.A.V.C. (retd.) Graduated London, July 19th, 1907. Died (in Johannesburg), April 15th, 1952.

SIMPSON, P. J., D.S.O., T.D., J.P., F.R.C.V.S., Lieut.-Colonel R.A.V.C. (T.F.) (retd.), of Knowle Croft, Shoppenhangers Road, Maidenhead, Berks. Graduated London, January 28th, 1899; Fellowship December 2nd, 1905. Died April 23rd, 1952; aged 74 years.

SWANSTON, Arthur Nelson Matcham, Major R.A.V.C. (retd.), Hillstow, Bank Crescent, Ledbury, Hereford. Graduated London, May 21st, 1898. Died January 27th, 1952.

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Death of Colonel Percy Simpson

We record above, with the deepest regret, the death of Lieut.-Colonel Percy J. Simpson, of Maidenhead, who passed away after a long period of ill health on the morning of Wednesday of last week, the sad intimation reaching us while our last issue was in process of printing. Elsewhere in these columns we pay tribute to this able practitioner who was well fitted to serve the profession, as he did, in the exalted offices of President of the Royal College and of the N.V.M.A. His name also will be associated enduringly in the minds of those in many spheres of life who mourn his loss, with almost a lifetime of tireless and successful effort on behalf of the Victoria Veterinary Benevolent Fund and the auxiliary he founded, the Ladies' Benevolent Guild.

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Death of Mr. Henry Frost Sparrow

Closure of 1881 List of "Existing Practitioners"

It is with deep regret that we record the death, which took place on April 25th in his 96th year, of Mr. Henry Frost Sparrow, of Fir Tree House, Rochford, Essex, who since the passing of his brother, Mr. Martin Thomas Sparrow, of Great Baddow, Essex, on February 6th last, at the age of 92, has been the sole survivor of the list of 866 "Existing Practitioners" set up under the Veterinary Surgeons Act of 1881. In our issue of February 23rd, 1952, the Registrar R.C.V.S., in the course of an historical note, pointed out that that Act protected the titles "Veterinary Surgeon" and "Veterinary Practitioner" and purported to place upon a separate register of "Existing Practitioners" those unqualified persons who had continuously practised veterinary surgery for not less than five years before the passing into law of the Act. It allowed a then unsuspected disciplinary loophole, however, which was not closed until, by the Amendment Act of 1920, those "Existing Practitioners" then remaining—a rapidly diminishing body—were given the title of "Veterinary Surgeon." When the Veterinary Surgeons Act, 1948, was being drafted the position of the two surviving Existing Practitioners, the brothers Sparrow, had to be considered. "The Ministry of Agriculture were advised that if these two gentlemen were not in practice then it would be unnecessary to take any action regarding their interests. However, the Registrar R.C.V.S. on communicating with each of them received the answer that despite their great ages, each of them was in some measure still in active practice. For these two gentlemen, therefore, section 29 of the Veterinary Surgeons Act, 1948, was added to the draft Bill and passed through Parliament."

The Sparrow family are a noteworthy veterinary institution in Essex, where the tradition is maintained by the deceased's nephew—Captain Harry Davis Sparrow (R.V.C., London, 1911)—and great-nephew, Major Leonard Harry Sparrow (R.V.C., 1941), both of Rochford. Actually, however, Mr. Henry Frost Sparrow's grandfather, William, was a Cambridgeshire farmer who went from Shudy Camps to Nevendon, Essex, in 1800, he being church warden there from 1818 to 1850. With one of his five sons, Charles Henry, was forged the first traceable link with the veterinary calling, he being indentured to Robert Rushbrook at Rayleigh in 1846, for three years. At the end of that time, after a short spell in London, Charles Henry Sparrow returned to Rayleigh to take over the practice of Mr. Mayhew. His sons, Henry Frost, Edwin Charles and Martin Thomas Sparrow, however, probably had veterinary connections elsewhere in East Anglia, as they recalled seeing name boards of "Sparrow, Veterinary Surgeon" at both Newmarket and Ipswich. In addition to Charles Henry, Edwin practised at Rayleigh, Martin at Great Baddow, near Chelmsford, and Henry Frost at Rochford, whither he went in 1874 at the age of 18 to help Mr. Simmonds, staying on to succeed him and marry his niece. He was indeed a remarkable example of faithfulness to the family's (unofficial) motto: "Hard work never killed anyone" He was vigorously engaged in practice until September, 1951, when, at 94, he was called upon to undergo a severe operation. This was a success and owing to his remarkable recuperative powers he was discharged cured within 15 days. At the time of Martin's death, however, his eyesight was failing and arthritis had crippled him somewhat, while he felt the loss of his brother severely. He was a Deputy Veterinary Inspector under the Board of Agriculture from 1876 to 1878, and a Veterinary Inspector from the latter year until about 1923, while until the close of his long, interesting and supremely useful life, he took pride in being helpful in the Rochford practice, as he certainly was.

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Publication of Proceedings of the Fourteenth International Veterinary Congress

There is now available from H.M. Stationery Office, at the price of £1 12s. 6d. net, the three volume report of the XIVth International Veterinary Congress held in London from August 8th to 13th, 1949. In all 78 discussions took place and the Congress was attended by 1,073 ordinary members representing 53 countries and also by 77 student members and 311 associate members.

The Report is arranged as follows:—

Volume I: Constitution of the Congress (Lists of authors, committees, delegates and members), and Report of the Plenary Sessions.

Volume II: Meetings of Sections 1, 2 and 3 (Animal Health and Animal Parasites; Animal Health and Bacteria; Animal Health and Viruses).

Volume III: Meetings of Sections 4, 5, 6 and 7 (Animal Health and Nutritional Factors; Husbandry and Animal Health; Animal Health and Veterinary Surgery; Animal Health in relation to Public Health).

As is stated in the Foreword common to each volume, "The success of the Congress has created a keen expectation that the friendships and collaboration established in London will be further strengthened at the meetings of the XVth International Veterinary Congress to be held in Stockholm in 1953."

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IMPORT RESTRICTIONS ON SOUTH AFRICAN PIG MEAT WITHDRAWN

Last autumn the importation of pig meat and pig products into Great Britain from the Union of South Africa was prohibited owing to an outbreak of swine fever in the Union. Reports received from the South African authorities show that no outbreaks of the disease have occurred this year and it has, therefore, been decided to withdraw the importation restrictions as from May 1st, 1952. An Order giving effect to this decision has accordingly been made by the Minister of Agriculture and Fisheries.

Copies of the Order, entitled the Importation of Pig Meat and Pig Products (Prohibition) (Revocation) Order, 1952, may be obtained from the Animal Health Division of the Ministry of Agriculture and Fisheries, Hook Rise, Tolworth, Surbiton, Surrey.

EAST MIDLANDS DIVISION DINNER-DANCE

The East Midlands Division, B.V.A., broke new ground on Thursday, March 20th, when it held its first annual dinner and dance at the George Hotel, Nottingham. One hundred and fourteen people were present to be received by the President (Mr. D. L. Hughes) and his wife, who were joined by Mr. Alan Wright (President, B.V.A.) and Mrs. Wright.

Guests included Dr. Dodd (President, East Midlands B.M.A.), Mr. Bowness (Chairman, Notts N.F.U.), Professor Robinson (Professor of Agriculture, University of Nottingham) and Sir Jack Drummond (Scientific Director, Boots Pure Drug Co.), together with their respective ladies. We were particularly glad to have with us Mr. F. A. Gordon (President, South-East Midlands B.V.A.).

Mr. Alan Wright, in proposing "The East Midlands Division," said how pleased the parent body always was to enter into the festivities of its children—the East Midlands was known at B.V.A. headquarters as a very virile child. He advised the Division to keep its interest in B.V.A. affairs by ensuring that its representatives were men who would take an active and interested part in their Committee work and who would come back from those Committees prepared to inform the Division of matters discussed there. The President then went on to deal with the part that our profession could play in the affairs of agriculture and public health. "We are no longer the Cinderella of the professions," he said, "and we are determined that the wonderful service which we can and do give to agriculture will be used for the common good." He instanced how our work in the field of meat production and inspection and milk production and inspection was a valuable contribution to public health—and a contribution which we, and we alone, could give.

Dr. David L. Hughes, in responding to the toast, thanked the President and his wife for the honour they had paid us in gracing us with their presence. He agreed completely with Mr. Wright's remarks on public health and said that foreigners visiting this country were constantly amazed by the haphazard approach made to these problems—he was sure that a completely new approach was needed. Emphasising the big drain on agriculture of disease, Mr. Hughes pointed out that in the 140,000 sheep in the counties of Notts, Derby and Leicestershire, the scientific treatment of the worms which they carry would add another 100 tons of mutton and lamb to the meat production of these three counties alone; he further underlined that this and many other disease problems could be alleviated and controlled were we allowed to go ahead and use only existing knowledge and control methods.

Mr. R. H. Smythe proposed the toast "The visitors and ladies" and was in his usual good-humoured and humorous form; the toast was responded to in a witty speech from Sir Jack Drummond.

Dancing continued until 1 a.m., when the guests were speeded on their respective ways with hot soup, after having enjoyed a most successful evening.

Our thanks are due to Boots Pure Drug Company for the donation of several prizes and to members of the Dance Committee and their wives for the organisation of the evening and of a raffle, which enabled the Division to send the sum of £11 3s. to the Victoria Veterinary Benevolent Fund. W. H. C.

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SUFFOLK F.U. SUPPORT LEVY FOR ANIMAL HEALTH TRUST

The County Executive of Suffolk F.U., considering that the Animal Health Trust should be supported by farmers, has decided to ask Headquarters to draw up a scheme for a levy on livestock and livestock products, on condition that the money should be used for research in the field where it had been collected. Mr. H. H. Rash, making the proposal, said that the governing body of the Trust had now been reconstituted and it was time that the farming community took a greater part in the work. A very small levy would be sufficient.—*Farmer & Stock-breeder.*

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ROYAL SANITARY INSTITUTE CONGRESS

Deterioration in Slaughterhouse Standards

Addressing the annual congress of the Royal Sanitary Institute, held last week at Margate, Mr. H. E. Bywater, Chief Veterinary Officer, West Ham, indicated that while standards of hygiene had improved in most fields of the food industry, slaughterhouse standards constituted a lamentable exception. "The standard of hygiene in the slaughterhouses of Britain has never at any time been very good, but since the Ministry of Food assumed control of the slaughter of animals (the flesh of which constitutes our rationed meat supplies), far from keeping pace with improvements in the production of other foodstuffs, the standard in slaughterhouses has markedly deteriorated, until the present position cannot but give rise to grave disquiet to anyone who has a knowledge of the subject."

Private slaughterhouses, before Ministerial control, had much

higher hygienic standards than prevailed to-day. When slaughtering was centralised, the careful retail slaughterer was eliminated and hygiene tended to fall to the lowest common denominator.

At our present slaughterhouses, inadequate in size and general layout, meat was often subjected to gross bacterial contamination —especially during the second half of the year when warm weather combined with a glut of animals greatly in excess of the facilities available.

It had been stated that lack of cold storage in this country made it necessary to issue immediately meat slaughtered in the glut period instead of holding it for future use. Mr. Bywater suggested that, even if facilities were available, it would be impossible to use them. The gross bacteriological contamination present on the bulk of carcases killed during the peak period so reduced the keeping qualities as to make them unsuitable for storage.

Milk Drying on Farms

In the same (veterinary hygiene) section Professor Harold Burrow, Professor of Veterinary Medicine in London University, pointed out that the cost in 1949-50 of milk transport in this country had been estimated at nearly £4,500,000. That seemed to be a lot of money to spend on the transport of a commodity of which at least 85 per cent. by weight was water. He therefore suggested that the milk should be converted to powder on the farm. There would be economic, strategic, and administrative advantages.

Earlier in his address Professor Burrow stressed the necessity for further exploration and research into the possibilities of the vaccination of cattle against tuberculosis. Vaccination would not be antagonistic to the policy embodied in the attested herd scheme: it would be a guarantee against the possibility of a calamitous position arising should infection be introduced once all our herds had reached attested standard.

The proceedings of the section, which met under the Presidency of Sir Thomas Dalling, former Chief Veterinary Officer, Ministry of Agriculture, will be dealt with more fully in our columns at a later date. The Recording Secretary was Mr. W. Brennan De Vine.

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IN PARLIAMENT

In the House of Commons on Friday of last week, the Cockfighting Bill was read a second time and committed to standing committee.

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Slaughterhouses

Mr. Baker asked the Minister of Food if he will open up a larger number of slaughterhouses, so as to allow greater efficiency and greater decentralisation, as well as less wastage in transit, in the slaughter of livestock.

Major Lloyd George: The question of bringing into use some additional pre-war slaughterhouses has been reviewed by my Department, which has been assisted by seven area advisory committees comprising representatives of the meat trade, the Farmers' Unions and the slaughtering industry. It has been found that less than a dozen could effectively be brought into use. It would not necessarily follow that a large increase in the number of slaughtering points would secure an economy in transport taking into account the arrangements for the transport of stock to an increased number of centres and for the collection of the by-products.

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GOVERNMENT EMPHASIS ON MEAT PRODUCTION

The statement on farm prices, issued on Friday of last week by the Minister of Agriculture, emphasised the necessity, in the Government's view, for a greater output of livestock and livestock products and spoke in general terms of financial inducements to that end. "One aspect we shall immediately discuss with the National Farmers' Union is the minimum prices for livestock and livestock products for 1954-55 and 1955-56. The Government intend to raise minimum prices for livestock products from their present unrealistic level to something much nearer current prices.

"The Agriculture Act provides for varying the methods by which its objects are achieved. By this award we are fixing prices for livestock products up to March 31st, 1953, and for the 1953 crops, and we shall shortly be fixing minimum prices up to 1956. . . . There is general agreement as to the character of the task ahead. It is, in broad outline, to produce not only more feed for our livestock but also as much wheat for our own consumption as we reasonably can and enough potatoes to satisfy consumption demands; to maintain our supplies of milk and eggs; but above all to do our utmost to produce more meat.

"We have decided to hold unchanged until March 31st, 1953, the basic release prices of feeding-stuffs. We propose also to lay before the House a scheme for continuing ploughing-up grants, and a scheme to extend the subsidy on fertilisers; and, subject to the necessary statutory authority, to authorise the renewal of a calf subsidy. For this last purpose we have allocated a total of £4,500,000, and we have agreed with the industry that we shall jointly work out a scheme under which this amount will be devoted not only to a subsidy on suitable steer calves but also to its extension to heifer calves of recognisable beef types."

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ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Anthrax:

Cardiganshire.—Gwern-yr-Efail Farm, Cross Inn, Llandyssul (April 21st).

Cumberland.—The Wath Farm, Upton, Wigton (April 23rd).

Derbys.—Elms Farm, Barrow-on-Trent (April 24th).

Devonshire.—Lower Colesworthy Farm, Liverton, Newton Abbot (April 25th).

Hunts.—Sapley Lane Farm, Hartford (April 17th).

Kirkcudbright.—Cairney Hill Farm, Borgue (April 17th).

Lancs.—Corporation Abattoir, Bury (April 21st).

Leics.—Gilmorton Lodge, Gilmorton, Rugby (April 24th).

Lothian (E.).—Barkrigg Farm, Haddington (April 17th).

Midlothian.—Easter Currie, Currie (April 17th).

Norfolk.—Hall Farm, Whitwell, Reepham, Norwich (April 21st).

Somersetshire.—Lower North Town Farm, North Cadbury, Yeovil (April 19th); Tabor Farm, Tinsbury, Bath; High Bridge Farm, Ditcheat, Bath (April 21st); The Orchards, West Hay, Glastonbury (Disease at: Nocris Field, Burtle, Bridgwater) (April 24th); Rubbery Farm, East Lydford, and Wytham Manor Farm, Compton Dundon, Somerton; Highbridge Farm, Ditcheat, Bath (April 25th).

Staffs.—Rock Tenement Farm, Wetley Rocks, Stoke-on-Trent (April 17th).

Stirlingshire.—Carbeth Home Farm, Killearn, Glasgow (April 23rd).

Yorks (E.R.).—Cobble Hall, Catwick, Hull (April 24th).

Foot-and-Mouth Disease:

Aberdeenshire.—Netherhills, Fisherie, Turriff (April 26th).

Berks.—Northfield Farm, Sparsholt, Wantage (April 26th).

Cheshire.—Lane End Farm, Chorlton, and Mill Farm, Barthowley, Crewe; Elms Farm, Calveley, Tarporley (April 24th); Stoke Manor Farm, Stoke, and Oak Tree Farm, Poole, Nantwich; Mile House Farm, Leighton, Crewe (April 25th); Blakenhall Farm, Blakenaall, Nantwich; Brook Farm, Cholmondeston, Winsford (April 26th); Lea Hall Farm, Wybunbury, Crewe; Verona Farm, Stoke, Nantwich (April 27th); Grange Farm, Bramhall, Stockport (April 28th).

Hants.—Midgham Farm, Fordingbridge (April 28th).

Staffs.—Heybridge Farm, Lower Tean, Stoke-on-Trent (April 24th); Rectory Farm, Checkley, Stoke-on-Trent; Hall Farm, Tean, Stoke-on-Trent (April 25th); Willoughbridge Farm, Pipegate, Woore, Crewe (April 25th); Green Farm, Checkley, Stoke-on-Trent (April 26th); Manor Farm, Checkley, Stoke-on-Trent; Fole Hall Farm, Uttoxeter (April 27th); Fole Farm, Uttoxeter (April 28th); Gorsty Hill Farm, Cheadle, Stoke-on-Trent (April 29th).

Sussex (W.).—Birchwood Farm, Southwater, Horsham (April 27th); Castle Farm, Rye Harbour, Rye (April 29th).

Fowl Pest:

Essex.—204, Range Road, Ilford (April 17th).

Lincs (Kesteven).—Hillcrest, Sleaford Road, Heckington, Sleaford (April 19th).

Swine Fever:

Berks.—The Bridle Path, Blundells Road, Tilehurst (April 23rd).

Essex.—Higham, Tolleshunt-Knights, Maldon (April 23rd).

Glouc.s.—Churches Mills, Woodchester, Stroud (April 22nd).

Hants.—1, Avenue Farm, Sycamore Road, Farnborough (April 21st).

Herts.—Bury Farm, Codicote, Hitchin (April 17th).

Lancs.—Railway Goods Yard, Henpens, Chatburn (April 17th). Stonelands Farm, Gt. Eccleston, Preston (April 21st).

Lincs (Holland).—Hillmore, Little London, Spalding (April 23rd).

Notts.—102, Church Lane, Underwood (April 21st).

Staffs.—May Farm, Whitgreave, Stafford (April 26th).

Sussex (E.).—Welshwood Farm, Jarvis Brook, Crowborough; Orchard Cottage, Stone Cross, Crowborough (April 17th).

Sussex (W.).—Horsham Road Poultry Farm, Steyning (April 22nd).

Warwick.—Coombe Fields Farm, Smeaton Lane, Streeton-under-Fosse; Lyndhurst, 78, Sutton Road, Erdington, Birmingham (April 21st).

Yorks (W.R.).—Heights Farm, Delph, Oldham (April 21st).

LEGAL NOTES

Failure of Action for Negligence Following Slaughter of Suspected Tuberculous Cow

In its issue of April 22nd the *Belfast Telegraph* reports that at Coleraine Quarter Sessions, before Judge Copeland, Dr. James A. Hamilton, Ballydevitt, Aghadowey, sued Mr. William O. Harper, M.R.C.V.S., and the Ministry of Agriculture, Stormont, Belfast, for £70 damages sustained by him through the alleged negligence of Mr. Harper in the inspection and diagnosis of a half-bred Jersey cow and for, as alleged, wrongfully causing the animal to be slaughtered. Alternatively, Dr. Hamilton sued for £70, being compensation due by the Ministry of Agriculture for the slaughter of the animal by them or their servants.

Mr. M'Grath, for the plaintiff, said Dr. Hamilton was a retired medical practitioner and carried on a dairy farm at Aghadowey. Mr. Harper was a veterinary inspector for the Ministry and from the results of a test his suspicions that the cow was suffering from tuberculosis were confirmed. He then, as he was empowered to do, decided to have the cow slaughtered. The Order provided that before an animal was slaughtered its value should be agreed between the inspector and the owner and the owner must sign a form agreeing to the price arrived at. On receipt of the Ministry's report the sum of £12 was agreed by plaintiff, and when the animal was destroyed a *post-mortem* examination was held. It was then found that the cow was perfectly sound.

Dr. Hamilton said he had paid £50 for the animal.

Mr. Harper, in evidence, said that in December, 1951, he noticed the cow had an enlarged gland at the udder and a week later it was coughing very badly. There was some chronic disease present in the cow's lungs and the animal, in his opinion, was in poor condition. An animal could be so badly affected that it would not react to tuberculin tests.

Dr. James Pearson, M.R.C.V.S., of the Ministry research department, said he had never known of a case of this kind before in his experience at Stormont. The animal in question was found not to have tuberculosis when a *post-mortem* examination was performed. The sample taken in this case appeared to be tubercle-infected but when tested on guinea-pigs had no effect on them.

Judge Copeland said plaintiff had the right to object before the animal was slaughtered but he did not exercise his powers. It was a case of being wise after the event and it was unfortunate that this animal had to be slaughtered when it turned out afterwards to be sound. He dismissed the case on the merits.

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FOOT-AND-MOUTH DISEASE IN SCOTLAND

Since the publication of the note in our last issue giving the foot-and-mouth disease position, 25 new outbreaks have occurred, including one at Fisterie, near Turriff. This outbreak among cattle and pigs at a farm on the border of Banffshire and Aberdeenshire has created much uneasiness in northern Scotland, where there are many valuable pedigree herds. There have been further outbreaks in Berkshire, Cheshire, Hampshire, Staffordshire and Sussex and since the present epidemic began on November 14th, 1951, the number of outbreaks, on Tuesday last, had totalled 196, involving 11,259 cattle; 5,612 sheep; 5,164 pigs and 18 goats. The latest figures, for the first 155 cases, show that up to April 14th, £557,317 has been paid in compensation.

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Outbreak in Saskatchewan

After having hoped for some time that they were now "out of the wood," the Canadian authorities, to their consternation, were confronted on April 23rd with a new outbreak of foot-and-mouth disease, reported from Ormiston, a district, 100 miles south-west of Regina, Saskatchewan. It is the first to be reported in the infected area of southern Saskatchewan since March 8th. Twelve head of cattle were reported to be infected.

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NATIONAL AGRICULTURAL ADVISORY SERVICE

Mr. Arthur Jones, M.A., B.Sc., B.Litt., has been appointed as Chief Farm Management Advisory Officer in the N.A.A.S.; he will be responsible for developing and co-ordinating farm management advisory work throughout the country. Mr. Jones, who is stationed at the Ministry's headquarters in London, took up his appointment on April 28th, 1952.

Mr. J. W. Reid, N.D.A., County Agricultural Officer for the county of Shropshire, has been appointed as Deputy Provincial Director for the South-Western Provincial Sub-centre at Starcross, Devon, as from June 3rd, 1952.

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"This Grass of Ours"

In the course of an article published under the above heading in its April issue *The Home Farmer* (the journal of the Milk Marketing Board) observes:—

"Grass is easily our dominant crop and, since it is utilised in one form or another entirely for livestock, it is not difficult to appreciate that our agricultural industry must continue to develop successfully livestock and livestock products as its broad basis. In turn, the foundation stone of a bigger and better livestock industry must surely be bigger and better crops of grass. This grass is consumed *in situ* by the majority of our stock from April or May until well into the autumn period. At the same time, a very important proportion must be conserved by one method or another, during the growing period, to provide for winter feeding when normal growth has ceased and, in the majority of cases, grazing has become impracticable.

"Grassland experts in general are now agreed that the potentialities of increased grassland productivity are very substantial, and, in addition, grass can also be suitably regarded as a means of conserving and improving soil fertility. This new outlook on grass and grass crops has, no doubt, grown with the development of temporary leys, using both complex and simple mixtures of vigorous and more suitable strains to suit our variable clime, and the contemporary development of the more judicious use of fertilisers for grassland crops on a par with that of arable crops. These leys are generally more vigorous and productive than permanent grass and augur well for the future.

"The Government has recognised the importance of the role our grassland can play in farming economy in particular, and the national economy in general. So much so, that a new policy of Grassland Development was introduced as an important part of the Four Year Expansion Programme, announced in 1947, by the Minister of Agriculture and Fisheries. In the main, this Grassland Campaign aimed at a 20 per cent. increase in production from all our grasslands, to enable the country's farmers to build up our livestock industry on a smaller than pre-war grassland acreage.

"Great strides have been made during the past four years. A few pioneers have paved the way by successfully demonstrating their methods for a new progressive grassland technique. This technique is now more generally known and acknowledged in most counties, but progress is still slow. The main task still appears to be the necessity to convince the majority of farmers of the advantages to their own interests of this more intensive system. Between the wars we experienced a period of almost unlimited supply of cheap imported concentrated feeding-stuffs and, during that time, much of our grassland undoubtedly took a back seat. Now the tempo has changed and it is more than ever necessary to a successful farming economy to improve our grassland and rely almost entirely upon home-grown feeding-stuffs and grassland products.

"World conditions and our own interdependent price structures without doubt affect the position gravely, but it is probably true to say that the future of this "Grass of Ours" is a rosy one. Imported feeding-stuffs have been reduced by approximately 5,000,000 tons or 50 per cent. over the past 10 years. Our animals have needed an alternative supply of food to make good this huge reduction of imported feed. The answer has been: more grass, better grass—and we need still more grass and better grass, if our industry is to continue to prosper. The answer is before us: properly treated grassland, improved techniques, extension of ley farming, extended grazing and growing seasons early and late and better conservation methods for the important winter fodder, so that conserved grass can take its rightful place in the farming economy of to-day as a winter production ration and not, as so often happened in the past, as solely maintenance ration.

Grass Drying on Communal Lines

"The Milk Marketing Board, encouraged by the need for the efficient conservation of better quality grass for winter feed, set up an experimental Grass Drying Station on communal lines at Thornbury, in Gloucestershire, in 1947. The following year this pilot plant was followed by others and, finally, the Board introduced 12 Grass Drying Centres in various parts of England and Wales. These centres are all run communally on a non-profit basis with the co-operation of local farmers within a reasonable working distance of each centre. Although centrally controlled from the Board's Head Office at Thames Ditton, Surrey, each centre is independent, having its own manager and the help and guidance of its own advisory committee. These committees—comprised, as they are, of farmers of sound experience and foresight—have given invaluable assistance and guided the Board and its Grass Drying Department in making studied modifications to plant and equipment and contract terms and conditions, during the past four years. Much valuable help has also been forthcoming from Grassland personalities throughout the country and from the National Agricultural Advisory Service, National Farmers' Union, County Agricultural Executive Committees and the like . . .

"During the 1950 and 1951 seasons, the Board's Grass Drying Department obtained the co-operation of one or two farmers at each of the Board's Grass Drying centres and, in a very simple

way, set out to ascertain the benefits (if any) obtainable from this more intensive treatment of grass land. The selected fields were, in some cases, young vigorous leys but permanent grass meadows (typical of the permanent grassland of the district) were also used for our fertiliser trials at one or two centres. The fields were soil tested and basic deficiencies of lime, phosphates and potash made good before the trials were started. No hard and fast rules were laid down for fertiliser treatment but, in the main, a Concentrated Compound Fertiliser was applied at the rate of 6 to 10 cwt. per acre, spread over two, and in some cases three, applications through the season, the first dressing being applied in March. In addition to this, nitrogenous fertiliser was applied at a similar rate of 6 to 10 cwt. per acre, spread over the season in three, four, and in some cases five, dressings of about 2 cwt. per acre per application.

"The results of this treatment were outstandingly successful in almost every case. Growth was sustained through dry summer periods, leaf development was tremendously improved, fibre content was reduced and protein content was increased. Overall production per acre was raised almost beyond belief and on these trial fields four and sometimes five cuts were taken during the season.

"The average yield from all these demonstration fields was 56 cwt. of dried grass per acre with an average crude protein content of 17·2 per cent. If the three poorest results are excluded (one of these referred to an aerodrome with very low basic fertility), the average yield was 72 cwt. of dried grass per acre with average crude protein content of 17·2 per cent. In comparison, the average quality of all contracted fields for the same season was 14·9 per cent. protein. It will thus be seen that the quality of our product was greatly improved by better management and intensive fertiliser treatment. Over the past two seasons approximately 70 per cent. of the dried grass from these trial fields provided a balanced ration or better, whereas the corresponding figure for all contracted fields was only about 35 per cent.

"On the costs side, the picture is also clear. The trial fields produced dried grass which cost between 5 per cent and 10 per cent. less per unit of protein than the average of all other fields and the average yield of protein per acre was approximately 25 per cent. higher on the trial fields than on normal contracted fields."

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COLONEL LLEWELLYN: "LEADING RIDER IN EUROPE"

On the occasion of her visit to the three-day Olympic test at Badminton, Her Majesty the Queen presented a bronze statuette of his famous show jumper Foxhunter to Lieut.-Colonel Harry Llewellyn. It was given to him by the British Show Jumping Association in recognition of his award of the title "leading rider in Europe" for the third year in succession.

This is a record which has never been achieved before. It is assessed by the Fédération Equestre Internationale on the number of individual victories gained in international shows during the year. For the years 1949, 1950 and 1951 Colonel Llewellyn's figures were 25, 37 and 26.

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BRITISH STANDARD RECOMMENDED COMMON NAMES FOR PEST CONTROL PRODUCTS•

The British Standards Institution has recently published a list of recommended common names for a number of chemical products used in pest control. The list has been drawn up by a committee consisting of representatives from the industries concerned and from other interested bodies. The British Veterinary Association was represented on this committee.

In a foreword the report draws attention to the great advances which have been made in the development of chemicals for pest, weed and rodent control during the last 25 years. Attention is drawn also to the confusion which has arisen as the result of the use of various shortened names in place of the complex chemical names of many of these compounds. The committee which formulated this British Standard list was set up as the result of discussions at the Commonwealth Entomological Conference in 1948.

The published names do not conflict with proprietary names but are intended for common use to assist users in the identification of the active ingredients of pest control products having otherwise cumbersome technical names. During the drafting stages the technical committee has maintained liaison with the Commonwealth countries as well as with the appropriate committee in the United States, and wherever possible the names adopted are those already accepted as coined common names by the U.S. Inter-Departmental Committee on Pest Control.

The present list is divided into three classes:—

(1) Insecticides.
(2) Fungicides.
(3) Herbicides.

In each case the recommended common name is followed by the chemical name or names, the chemical formula and an indication of some of the other names which have been used.

The committee is continuing its deliberations and will publish further lists from time to time.

• B.S. 1831, Part 1, 1952. Price 2s. 6d., British Standards Institution.

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AGRICULTURAL POISONS

"The chemical warfare which is waged against the insect pests that ravage our food crops has increased in intensity as well as in effectiveness in recent years," writes "Onlooker" in *The Pharmaceutical Journal* and continues: "The basis of many recent developments is the use of a number of synthetic chemical substances which are highly lethal to the destructive parasites. Unfortunately these compounds—at least many of them—have a toxic action on human beings who are exposed to them for long periods, as, for instance, during their manufacture or packing or in their extensive use. The risk to the amateur gardener who employs these chemicals occasionally to spray his fruit trees or his roses is probably insignificant. The same is not true of those who use them extensively on farms or market gardens. The magnitude of the danger to health can be gauged from the fact that there has been presented in the House of Lords a Bill to provide for protection against these hazards. This is but an extension of the general care that is taken to safeguard industrial workers from the toxic action of materials they must handle in their work."

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Task of the World's Farmers.—The task of the world's farmers is becoming progressively more difficult. The fact of outstanding importance is, of course, the growing number of consumers. The last complete estimate of world population, made in 1949, gave a figure of 2,378,000,000, and the subsequent increase may probably have been about 75,000,000. Since there is no prospect of any comparable addition to the total area of farm land, and since there is a continuing wastage of soil by erosion, there are no means, other than improved farming methods, by which the present levels of nutrition, deplorably low as they are in many countries, can be maintained. The progress of farm production, during the past dozen years, has clearly not been fast enough. It is reckoned that during this period the total acreage of food crops has increased by about 3 per cent, and that yields per acre have risen by about 6 per cent, making an overall increase in food output of 9 per cent. Meantime, population has risen by 13 per cent.—Sir James Scott Watson: *Agriculture.*

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

LONGEVITY IN THE EWE

Sir,—Mr. R. C. Locke's letter is of considerable interest in assessing the life span of the ovine species when left under natural conditions.

The most authentic record I have found is of a local farmer who purchased a Black Welsh Mountain ewe lamb in 1924 and she reared twin lambs every year from 1925 up to and including 1948. She died in 1949 from natural causes. In all, she reared a total of 46 lambs, all of which lived and all were black.

Black wool is once again in demand—previously under "wool controls" it was not wanted. In "pre-control" days it fetched a bonus of about 2d. per lb. Les affaires sont les affaires!—Yours faithfully, A. Sutherland, 286, High Street, Bangor, North Wales. *April 26th*, 1952.